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(Editorial policy continued on inside back cover)

Cover Photo: Marbled Salamander *Ambystoma opacum* from Appomattox-Buckingham State Forest.

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Herpetological Survey of Appomattox-Buckingham State Forest and Holliday Lake State Park, 30 September, 2018

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Abstract: Volunteers of the Virginia Herpetological Society conducted a fall survey of Appomattox-Buckingham State Forest and Holliday Lake State Park in Appomattox and Buckingham counties. Two areas were surveyed, one site was primarily in Holliday Lake State Park in Appomattox County and another site was primarily in Appomattox County but also crossed into Buckingham County within the state forest. Survey methods included hand capture and visual observation of species. A total of 21 species were recorded, including one species, the Smooth Earthsnake (*Virginia valeriae*), that was not previously recorded in Buckingham County. A previous inventory in a nearby location in Appomattox county was completed in 2003 and 2004, which used a variety of sampling methods and over two complete breeding seasons (late December through September) and many more species were noted then. The VHS plans to survey other parts of this area in the fall and plans to perform surveys during the breeding season with more sampling methods to increase the number of species that have been observed in the county.

Key words: Survey, Appomattox County, Buckingham County, Appomattox-Buckingham State Forest, Holliday Lake State Forest, *Virginia valeriae*

INTRODUCTION

Appomattox-Buckingham State Forest (ABSF) is located in both Appomattox and Buckingham Counties, and Holliday Lake State Park (HLSP) is located in Appomattox County, nested within ABSF. ABSF was originally comprised of mainly farmland, but by the 1930s the land had become unproductive and eroded. The federal government began purchasing tracts of land at that time under the Bankhead-Jones Farm Tenant Act, which was enacted to help conserve and restore the land. In 1954 the land was deeded to the Commonwealth and grew to 8,000 hectares (19,808 acres). Today the ABSF is managed and used as a source of sustainable timber harvest and wildlife habitat. Recreational activities include hiking, horseback riding, hunting and fishing. The forest includes a variety of habitats including creeks, streams, seeps, vernal pools, upland forest, and open meadows. The dominant vegetation includes oaks, hickories, yellow poplar, red maple, and pines.

HLSP is nested within ABSF on the Appomattox County side of Holiday Creek. The park includes Holiday Lake and a variety of short trails, as well as recreational camping, swimming, and fishing. The forest includes a variety of habitats including creeks, streams, seeps, vernal pools, upland forest, and open meadows. The dominant vegetation includes oaks, hickories, yellow poplar, red maple, and pines.

These properties are of interest to the VHS Conservation Committee because few official surveys have been conducted in the area, as exemplified by the current list of species observations for both Appomattox and Buckingham Counties. Due to the paucity of survey data from the area and the variety of habitats, there is potential for several county records and interesting finds.

Due to the large area to be surveyed, a pre-survey was conducted to locate potential surveying sites within both ABSF and HLSP. Future surveys are planned for the area to cover other parts of ABSF and HLSP that were not surveyed. Sunday was the day chosen to avoid any safety concerns with hunting season (Monday-Saturday). Twenty-one participants were present.

Survey Sites

The following is a general description of the survey areas. Coordinates were specific GPS coordinates provided by the group leaders at the survey starting point.

Site-1-Lakeshore Trail (37.395366°N, -78.640862°W) is located within HLSP near the boat ramp for Holiday Lake and at the trailhead for the Lakeshore Trail. This site includes Holiday Creek and Saunders Creek that feed into the lake. The main habitats found along the trail include wetlands, creeks, seeps, vernal pools, bottom forests, and upland forests.

Figure 1. Map showing the survey area within Site-1.

Site-2-Carter-Taylor Trail (37.433497°N, -78.638569°W) starts at the rear of the horse trailer parking area of ABSF. The dominant habitats around the trail include Holiday Creek and its tributaries, trout fishing trails that included seeps and wetlands, bottom forests, upland forests, and open fields. Since this site included both sides of Holiday Creek, both Appomattox and Buckingham Counties were included in this area of the survey.

Figure 2. Map showing survey area within Site-2.

MATERIALS AND METHODS

Twenty-one volunteers participated in the survey for approximately six hours (from 09:00 to 15:30h, lunch break for 30 minutes) in the field on 30 September for a net survey total of 126 person hours. Two survey groups were organized to survey two sites (Sites-1 and 2 as described above). Weather conditions were overcast skies in the morning and partly cloudy with some sun in the afternoon. Temperatures started at about 19°C and went up to about 27°C by the conclusion of the survey.

Prior to the survey, all participant footwear and survey gear (snake hooks, field sticks, dip nets etc.) were disinfected using a 10% bleach solution with water. Survey participants used multiple collecting methods to find amphibians and reptiles, including visual observation, listening for calling anurans, hand capture, and over-turning objects with snake hooks and field sticks. All captured animals were observed to identify possible malformations, injuries or disease and other unique markings and characteristics. Digital photos were taken of many of the captured animals prior to their

release at the site of capture. Survey group leaders summarized and submitted all relevant data on VHS survey group data sheets.

Table 1. Summary of the survey effort.

Survey Area	No. of Surveyors	Hours	Estimated Person Hours
1-Lakeshore Trail (HLSP)	12	6	**72**
2-Carter-Taylor Trail (ABSF)	9	6	**54**
Total			**126**

RESULTS

A total of 22 species were captured or positively identified, including 12 Amphibians and 10 Reptiles (Table 3). The survey produced a total of five anuran, seven salamander, four snake, three turtle, and three lizard species. About 71 individual animals were captured or observed and positively identified. In Buckingham County there was one county record (*Virginia valeriae*). Table 3 summarizes the results.

Table 3. Survey Results (*denotes species county record)

County	Appomattox	Buckingham	Total
Class Amphibia			
Anuran Species			
Acris crepitans	13	4	**17**
Lithobates catesbeianus	1	0	**1**
Lithobates clamitans	1	0	**1**
Lithobates palustris	1	0	**1**
Pseudacris crucifer	1	0	**1**
Total Anurans			**21**
Salamander species			
Desmognathus fuscus	2	3	**5**
Eurycea cirrigera	1	0	**1**
Eurycea guttolineata	4	0	**4**
Notophthalmus v. viridescens	3	0	**3**
Plethodon cinereus	8	1	**9**
Plethodon cylindraceus	1	2	**3**
Pseudotriton ruber	1	0	**1**
Total Salamanders			**26**
Total Amphibians			**47**
Class Reptilia			
Snake Species			
Coluber c. constrictor	0	1	**1**

Diadophis punctatus	2	0	**2**
Opheodrys aestivus	1	0	**1**
*Virginia valeriae**	0	1	**1**
Total Snakes			**5**
Turtle species			
Chrysemys picta	6	0	**6**
Kinosternon s. subrubrum	1	0	**1**
Terrapene c. carolina	1	1	**2**
Total Turtles			**9**
Lizard Species			
Plestidon fasciatus	6	3	**9**
Sceloporus undulatus	1	0	**1**
Total Lizards			**10**
Total Reptiles			**24**

ANNOTATED CHECKLIST

Amphibians

1. *Acris crepitans* (Cricket Frog) Seventeen Cricket Frogs were observed throughout the survey and were found at both survey sites in both counties. Most were found near creeks and moist areas along the trails.

2. *Lithobates catesbeianus* (Bullfrog) One individual was observed near Holiday Creek within Site-2 in Appomattox County and was captured and appeared to be healthy.

3. *Lithobates clamitans* (Greenfrog) One juvenile was captured in Appomattox County along one of the streams within Site-1.

4. *Lithobates palustris* (Pickerel Frog) A total of six adults were captured or observed in a stream in Site-1. One female was found with about 36 mites, and another adult was found with two mites.

5. *Pseudacris crucifer* (Spring Peeper) One adult male was heard calling within the floodplain of a stream, and one adult was captured and released along the shore of Holiday Lake on the forest floor near a stream in Site-1.

6. *Desmognathus fuscus* (Northern Dusky Salamander) Two adults were captured under rocks near a stream in Site-1 and three adults were captured under woody debris near a stream in Site-2.

7. *Eurycea cirrigera* (Southern Two-Lined Salamander) A single adult was captured under roots along the bank of a small stream in Site-1.

8. *Eurycea guttolineata* (Three-lined Salamander) Three adults were captured under rocks near a stream, and one gravid female was found under a log in Site-1.

9. *Notophthalmus viridescens* (Eastern Newt) A total of three were found, one adult along the shore of Holiday Lake within Site-1, one eft was found, and another eft was found dead on a road.

10. *Plethodon cinereus* (Red-backed Salamander) A total of eight individuals were found under logs in Site-1, and one juvenile was found under a log in Site-2.

11. *Plethodon cylindraceus* (White-spotted Slimy Salamander) One adult was found under a large log in Site-1, and one adult male and a juvenile were found under logs near a trout trail in Site-2.

12. *Pseudotriton ruber* (Red Salamander) One adult was found under a log near a stream in Site-2, in Appomattox County.

Reptiles

13. *Coluber c. constrictor* (Northern Black Racer) One adult was found on the ground next to the trail on Site-2. The individual appeared to have a scar injury on one ventral scale, but otherwise appeared healthy.

14. *Diadophis punctatus edwardsii* (Northern Ring-necked Snake) Two adults were found under bark of a dead tree in Site-1.

15. *Opheodrys aestivus* (Rough Green Snake) One juvenile was found dead on a paved road in Site-1.

16. *Virginia valeriae* (Smooth Earth Snake) One adult was found near a trail next to a stream in Site-2. This observation is a Buckingham County record, no observations of the species had previously been reported.

17. *Chrysemys picta* (Eastern Painted Turtle) A total of six adults were observed basking on woody debris on Holiday Lake in Site-1.

18. *Kinosternon s. subrubrum* (Eastern Mud Turtle) One adult was found in a stream near a trail in Site-1.

19. *Terrapene c. carolina* (Woodland Box Turtle) One adult female was found on the trail in an open meadow in Site-1, and a juvenile was found on a trail in Site-2.

20. *Plestidon fasciatus* (Five-lined Skink) Six individuals were found in Site-1, and 3 were found in Site-2.

21. *Sceloporus undulatus* (Eastern Fence Lizard) One juvenile was found on a tree near a trail in Site-1.

DISCUSSION

During the survey of HLSP and ABSF, the VHS survey groups positively identified more than 71 specimens representing 21 species (Table 3). There were 12 species of amphibians (five frogs and seven salamanders) and nine species of reptiles (four snakes, three turtles, and two lizards).

One new record, *Virginia valeriae* (Smooth Earth Snake), was documented for Buckingham County.

There was one species, captured and photographed in both areas surveyed, with designated conservation status as defined in "Virginia's 2015 Wildlife Action Plan" published by VDGIF; *Terapene c. carolina* (Woodland Box Turtle), which has a conservation status of *"Tier llla. High Conservation Need."* The opportunity ranking of **A** indicates "on the ground" species or habitat management strategies have been identified that are expected to benefit this species, at least some of which can be implemented with existing resources and have a reasonable chance of improving the species conservation status. For this species, habitat conservation and restoration are underway (open canopy forest and meadows preservation).

Prior to our survey, official surveys took place at the Appomattox Court House National Historical Park in Appomattox County in 2002, 2003, and 2004 as part of an Inventory and Monitoring Program managed by the National Park Service (Mitchell, 2006). The site surveyed by Mitchell is approximately 20 km west of the area of our survey in 2018. Several species were noted, many of which were not observed during our survey. The reason for this is because the inventory effort by Mitchell took place during the breeding season (late December through September) and over two seasons (2003-2004, and an initial survey in May 2002), as well as incorporated several strategic sampling methods, including audio surveys, road surveys, dipnet surveys, minnow trap surveys, turtle trap surveys, and visual encounter surveys. Biometric data was also taken during this survey for all captured individuals.

Upon completion of our survey, the volunteers were visited by park staff, including the park naturalist. The park naturalist reported observations of several species in Appomattox County, a few of which were not found during the survey, including in Appomattox County, Mole Kingsnake (*Lampropeltis c. rhombomaculata*), Dekay's Brownsnake (*Storeria dekayi*), Northern Watersnake (*Nerodia s. sipedon*), Red Cornsnake (*Pantherophis guttatus*), Common Ribbonsnake (*Thamnophis s. sauritus*), Eastern Gartersnake (*Thamnophis s. sirtalis*), Smooth Earthsnake (*Virginia v. valeriae*), Snapping Turtle (*Chelydra serpentine*), Fowler's Toad (*Anaxyrus fowleri*), Spotted Salamander (*Ambystoma maculatum*), Marbled Salamander (*Ambystoma opacum*); and in Buckingham County, Dekay's Brownsnake (*Storeria dekayi*), Coastal Plains Leopard Frog (*Lithobates s. utricularius*), Pickerel Frog (*Lithobates palustris*), and Green Treefrog (*Hyla cinerea*). In the future, VHS plans to survey additional areas of both HLSP in Appomattox County and ABSF in both Appomattox and Buckingham counties as the naturalist's reports need to be verified. We also recommend at least one survey in this area that occurs during the main breeding season for many species (late December through early June) and one that incorporates a variety of survey methods so that more species are included.

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A Herpetological Survey of the Chincoteague Bay Field Station Campus in Accomack County, Virginia

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Abstract: The Chincoteague Bay Field Station is located on an approximately 15-hectare plot of land on Virginia's Eastern Shore. This area was surveyed opportunistically for herpetofauna primarily *via* nocturnal visual encounter surveys from early July through mid-August 2017. A total of 141 amphibians and reptiles were encountered during surveys, consisting of seven species of anuran, one snake, one turtle, and unidentified lizards in the genus *Pleistiodon.* No salamanders were found during surveys, despite historic vouchers of *Plethodon cinereus* at this locality. The majority of observations consisted of the species *Anayrus fowleri* and *Hyla chrysoscelis*. The composition of species observed at this site may likely have been influenced by survey methods used and seasonality. Future survey work may reveal the presence of other species at this locality.

Key words: Herpetological Survey, CBFS, Accomack County

INTRODUCTION

The Chincoteague Bay Field Station (CBFS), formerly known as the Marine Science Consortium, was founded in 1968 by a consortium of member Colleges and Universities for the purposes of coastal education and research. The CBFS Campus has been located in Wallops Island, Accomack County, Virginia (adjacent to NASA's Goddard Flight Facility) since 1971. The CBFS campus encompasses academic buildings and supporting structures (e.g., offices, dormitories, cafeteria) and the campus property resides in a matrix of open fields bordered by woodlands consisting of approximately 15 hectares, which may support a variety of herpetofauna known from Virginia's Eastern Shore (Mitchell, 1999; Mitchell and Reay, 1999; Mitchell, 2002). In 1986, C. A. Pague and others collected a series of *Plethodon cinereus* in the vicinity of the CBFS campus which are preserved in the Carnegie Museum of Natural History (CM 129628-129672). However, no other records appear to be available regarding the occurrence of herpetofauna on the CFBS campus. This report summarizes the results of an opportunistic herpetological survey conducted on the CBFS during the summer of 2017.

Survey Site

Site 1. Chincoteague Bay Field Station (CBFS) Campus (37°56'08.7"N 75°28'56.5"W). Due to the relatively small size of the CBFS campus, the entire campus was considered a single study site during this survey (Figure 1). The CBFS campus consists mainly of open fields with minor wet areas and drainage ditches, woodlands, and anthropogenic structures (i.e., roads, buildings).

Figure 1. Aerial map depicting the Chincoteague Bay Field Station (CBFS) Campus.

MATERIALS AND METHODS

Surveys for amphibians and reptiles were conducted on the CBFS campus by the author from 2 July 2017 to 12 August 2018. Surveys techniques consisted of visual encounters and lifting and replacing cover objects. Digital photos were taken of each species observed when possible. A total of 30.5 hours of survey effort was conducted. The majority of survey effort (26 hours) consisted of nocturnal visual encounter surveys with a headlamp, during which all roads on the CBFS campus were walked (Figure 1) and any herpetofauna encountered as well as anuran calls heard were noted. These surveys were conducted 3-5 times per week and began immediately after dusk. The remainder of survey effort (4.5 hours) was spent searching under cover objects and conducting diurnal visual surveys.

RESULTS

A total of ten amphibian and reptile species were observed during the CBFS campus surveys in July and August of 2017, consisting of seven amphibian species and at least three species of reptile (skinks in the genus *Plestiodon* were observed but unfortunately could not be captured to photograph and verify identity; see annotated checklist below). A total of 141 amphibians and reptiles were observed during the survey (Table 1). No injuries or parasites were observed on any amphibians or reptiles during the survey.

Table 1. Amphibians and reptile species and summary on numbers observed during the survey of the Chincoteague Bay Field Station (CBFS) campus during July and August 2017.

Species	Total
Amphibians	
Anaxyrus fowleri	92
Hyla cinerea	5
Hyla chrysoscelis	24
Lithobates catesbeianus	2
Lithobates clamitans	6
Lithobates sphenocephalus	1
Pseudacris crucifer	2
Reptiles	
Chelydra serpentina	2
Pantherophis alleganiensis	1
Plestiodon sp.	6
Total Number of Observations	141

ANNOTATED CHECKLIST

Amphibians

1. *Anaxyrus fowleri* (Fowler's Toad). *A. fowleri* was the most abundant species found on the CBFS campus and commonly observed along roads at night and foraging under lights in the vicinity of campus buildings.

2. *Hyla cinerea* (Green Tree Frog). Four *H. cinerea* were observed at night on campus buildings. One individual was observed crossing Kearsarge Circle Road on the western side of campus during heavy rains. Calling of a few individuals was occasionally heard throughout the CBFS campus during rainy weather.

3. *Hyla chrysoscelis* (Cope's Gray Treefrog). *H. chrysoscelis* was commonly heard calling throughout the CBFS campus during rainy weather. Individuals were observed at night on campus buildings, along roads during rainy weather and calling from pools that formed in ditches along Mill Dam Road.

4. *Lithobates catesbeianus* (American Bullfrog). Two large *L. catesbeianus* were observed during heavy rains within a ditch along Mill Dam Road. Two small *L. catesbeianus* were observed along Enterprise Street in the center of campus at night following a rainstorm.

5. *Lithobates clamitans* (Green Frog). Six *L. clamitans* observed consisted of small individuals observed on campus roads at night following rains.

6. *Lithobates sphenocephalus* (Southern Leopard Frog). A single, small *L. sphenocephalus* was observed in a grassy area adjacent to Enterprise Street on a dry night.

7. *Pseudacris crucifer* (Spring Peeper). Two *P. crucifer* were observed on Mill Dam Road at night during rainy weather. Calling was heard occasionally to the north of campus property in early July.

Reptiles

8. *Chelydra serpentina* (Snapping Turtle). Two young *C. serpentina* were observed within a ditch along Mill Dam Road during heavy rains.

9. *Pantherophis alleganiensis* (Eastern Ratsnake). One *P. alleganiensis* was observed in a field adjacent to Kearsarge Circle Road on the western side of campus on a dry night.

10. *Plestiodon sp.* (Skinks). Two skinks in the genus *Plestiodon* were observed under cover and four were observed diurnally on buildings on the northern portion of campus. These skinks were observed but could not be captured to confirm identification or photographed. Two skinks in the genus *Plestiodon* are known from Virginia's Eastern Shore: *Plestiodon fasciatus* (Common Five-lined Skink) and *Plestiodon laticepts* (Broad-headed Sink); and both species are known from Accomack County (Mitchell, 2002). Therefore, skinks observed could have been individuals of either or both of these species.

DISCUSSION

At least 43 species of amphibians and reptiles (excluding sea turtles) are known from Virginia's Eastern Shore (Mitchell, 1999; 2002). The herpetological species diversity in this region is more depauperate in comparison to Virginia's mainland and other portions of the Delmarva Peninsula (Mitchell, 2002). This is likely due to a geological history of Virginia's Eastern Shore being inundated by more salt water historically, reducing colonization and/or establishment of amphibian and reptile species in this region, as well as recent habitat degradation be anthropogenic means (Mitchell, 1999; 2002). Excluding sea turtles, 41 species of amphibians and reptiles have been confirmed in Accomack County (Mitchell, 2002). This survey revealed the occurrence of ten amphibian and reptile species within the CBFS campus, all of which have previously been reported in Accomack County. Additionally, collection records for this location indicate the presence of *P. cinereus* at this site (however, this species was not found during this survey). Overall, this survey, in addition to this previous record for *P. cinereus*, suggests the presence of at least 11 amphibian and reptile species or approximately 27% of the known herpetological biodiversity of Accomack County utilize the CBFS campus.

Herpetological species diversity within Virginia's Eastern shore is biased toward a greater diversity of reptiles in comparison to amphibians (Mitchell, 2002). However, a greater number of amphibian's species were found during this survey and amphibian observations accounted for the vast majority (approximately 94%) of total herpetological observations. The greater number of amphibian species found and amphibian observations during this survey in comparison to reptiles may be the result of sampling methods, the season in which the sampling was conducted, or potentially the types of habitats in which these species may be found. For instance, the vast majority of herpetological observations during this survey were anurans on roads or near buildings during wet nights, when anurans

typically forage. Additionally, no salamanders, such as *P. cinereus*, were observed during this survey; however, this study was conducted during the warmest months of the summer when this species and other salamanders may retreat underground (Hulse et al. 2001; Meshaka and Wright, 2017).

Overall, herpetological observations during this survey typically consisted of few (i.e., < 10) observations of each species, with the exceptions of *A. fowleri* and *H. chrysoscelis.* Because most areas within the study site were surveyed regularly during an approximate six-week period and animals were not marked, at least some observations during this survey were likely of the same individuals. However, relatively few observations of most species during this survey may suggest that many species observed on the CBFS campus utilize the study site as a temporary habitat or as a corridor of dispersal rather than permanently reside there. For instance, the lack of any streams, ponds, or other water sources with the exception of ephemeral drainage ditches adjacent to roads may exclude the CBFS campus from being a permanent residence for certain species observed (e.g., *C. serpentina*, frogs in the genus *Lithobates*), which may have been temporarily using the CBFS campus as a corridor for movement/foraging following heavy rains. However, relatively greater observations of *A. fowleri* and *H. chrysoscelis* on the CBFS campus, as well as observation of individuals in multiple size classes and breeding aggregations of *H. chrysoscelis* strongly suggests the residence of populations of both species on the CBFS campus. Furthermore, although *A. fowleri* were not observed breeding on-site during the survey period, potential breeding habitat for this species was present within the drainage ditches and moist areas observed during surveys (Green 2005). Future survey work utilizing other methodologies (e.g., cover board surveys) and survey work during other seasons may reveal a greater abundance of and additional herpetofauna occurring within the CBFS campus.

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Herpetological Survey of Natural Bridge Park 11 and 12 June, 2016

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Abstract: On 11 and 12 June 2016 the Virginia Herpetological Society conducted a field survey of several diverse habitats located in Natural Bridge Park (NBP) in Rockbridge County, Virginia to identify amphibian and reptile species within NBP. Operational Management of NBP was assumed by the Virginia Department of Conservation and Recreation (VDCR) on September 24, 2016 and this report provides VDCR with an initial inventory of amphibian and reptile species for this new state park. Thirteen Amphibian (4 anuran and 9 salamander) and thirteen reptile (9 snake, 2 turtle and 2 lizard) species were positively identified. Noteworthy species included *Eurycea lucifuga* (Cave Salamander), *Plethodon hoffmani* (Valley and Ridge Salamander), *Lampropeltis t. triangulum* (Eastern Milsnake), *Regina septemvittata* (Queesnake) and *Terrapene c. carolina* (Woodland Box Turtle). One adult *E. lucifuga* was observed in an unusual habitat, about 28 meters inside the third chamber of a cavern far from the entrance and any visible openings. *E. lucifuga* usually inhabit the twilight zone area of caves, where there is some light but not enough for plants to grow. The sex of 10 *T. c. carolina* were identified, 9 of which were male. The 9/1 sex ratio of males to females is much higher than the 1/2 and 1.2/1 sex ratios reported in two previous Virginia distribution studies for *T. c. carolina.*

Key Words: Natural Bridge State Park, *Eurycea lucifuga*, *Lampropeltis t. Triangulum*, *Plethodon hoffmani*, *Regina septemvittata*, and *Terrapene c. carolina*

INTRODUCTION

Natural Bridge Park (NBP) is located in Natural Bridge, VA in Rockbridge County and contains the Natural Bridge which is a U.S. national historic landmark. This natural arch is approximately 66 meters (250 ft) high, spans 27 meters (90 ft) and is situated within a gorge carved from surrounding mountainous terrain by Cedar Creek, a tributary of the James River. On the dates of the survey, there were approximately 623 hectares (1,540 acres) of surrounding and nearby woodlands, grasslands, creeks, caves and ravines within NBP that are privately owned by the Virginia Conservation Legacy Fund (VCLF). VCLF acquired the property in 2013 to prevent it from being auctioned in parcels and to preserve the Natural Bridge and the surrounding natural habitat. However, as a result of an inability to service the debt required to acquire the property under their operational management, VCLF has accepted an offer from the Commonwealth of Virginia to manage this property as a Virginia State Park. It will continue to be owned by VCLF until all debts are repaid. The operational management transition occurred on September 24, 2016.

NBP is located at the top of Southside Virginia of the state's western Appalachian Mountains, what geologists call the Valley and Ridge Province. The parallel folds of mountains and valleys all run in a northeast-southwest direction. The valleys and rivers have served as a natural migration route for wildlife. Virginia's Valley and Ridge region is part of a gigantic trough that runs from Quebec to Alabama. Virginia's portion is distinctive for its size (greater than any other state), its narrow and elongated parallel ridges (3,000-4,000 feet high), flat lush valleys, gentle topography, caves, caverns and hot springs" (Smith 1998).

The Virginia Herpetological Society (VHS) selected NBP for its Annual Spring Survey as NBP contains some very interesting habitats for a variety of amphibian and reptile species and has not been previously surveyed by VHS. A VHS survey will also provide the Virginia Department of Conservation and Recreation ("VDCR") with an initial inventory of amphibian and reptile species for its new state park. Two survey dates were selected, Saturday 11 June and Sunday 12 June 2019. A total of 56 volunteers participated in the survey on 11 June and 21 volunteers participated on 12 June.

Survey Sites

The following is a general description of the survey zones. GPS coordinates were obtained via Google satellite maps at the approximate zone location contained in Figure 1.

Sites 1 and 2 - Golf Course Road Site-1 (N37.626052, W-79.550469) is located on the west side of Golf Course Road (State Route 760) and Site-2 (N37.624558, W-79.546601) is located on the east of Golf Course Road. The two sites are very similar in habitat with mixed hardwood and pine forest bordering large grassy meadows. Site-1 extends to the western NBP boundary. Site-2 contains some poorly maintained structures on its southern end and borders a ravine and creek and extends to site-4 on its eastern end. Both of these zones were surveyed on 11 June by the same survey group.

Site 3 - Cedar Creek Trail Site-3 (N37.634699, W-79.54893) is the area west of U.S. Route 11 to the western NBP boundary along cedar creek trail. Site-3 contains mixed hardwood and pine forest, creeks and caves. At the eastern end of Site 3 there is the Monacan Village, a large dump, some maintenance facilities and other structures. The westerly end of site-3 was surveyed on 11 June and the east and west ends were surveyed on 12 June.

Site 4 - State Route 608 Site-4 (N37.62642, W-79.539408) is the area east and west of State Route 608 and abuts site-2 on the west end, the NBP boundary on the south end and site-10 on the east end. Site-4 has a creek with steep ravines and rocky outcrops among mixed hardwood and pine forest. Tree species in site-4 include maples, oaks, chestnuts, pines as well as a variety of fern species. Site-4 was surveyed on 11 June.

Site 5 – Foamhedge Sites-5&6 are named for the foam replica of Stonehenge located in the northeast corner of Zone-6. Site-5 (N37.643484, W-79.549198) abuts NPB boundaries to the west and north, sites-6&7 to the east and site-3 to the south. Site-6 (N37.637163, W-79.551601) borders U.S. Route 11 to the east, site-3 to the south, site-5 to the west and site-7 to the north. Sites 5&6 have similar habitats of mixed hardwood and pine forest, open fields and wetlands. Sites 5&6 were surveyed on 11 June by the same survey group.

Site 7 - State Route 743 West Site-7 (N37.645285, W-79.540958) is the area at the northern boundary of NBP west of State Route 743. It borders Site-6 to the south and Site-5 to the west. Site-7 is comprised of mixed hardwood and pine forest, grassy meadows and contains a vernal pool. Site-7 was surveyed on 11 June.

Site 8 - Caverns Site-8 (N37.636891, W-79.536490) is located east of U.S. Route 11 and is boarded by Site- 9 to the south and the east and the NBP boundary to the north. Its habitat is mixed hardwood and pine forest, with scarlet oak, tulip, hickory, redbud and some evergreen trees but Natural Bridge Caverns are the most notable feature. Site- 8 was surveyed on 11 June.

Site 10 - West Faulkner Site-10 (N37.631776, W-79.530959) is the area east

and west of West Faulkner Highway (State Route 130). Site-10 is bordered by Sites-4 and 9 to the west and NBP boundaries to the north and the east. The habitat in Site-10 is mixed hardwood and pine forest, grassy meadows and creeks. Site-10 was surveyed on 11 June.

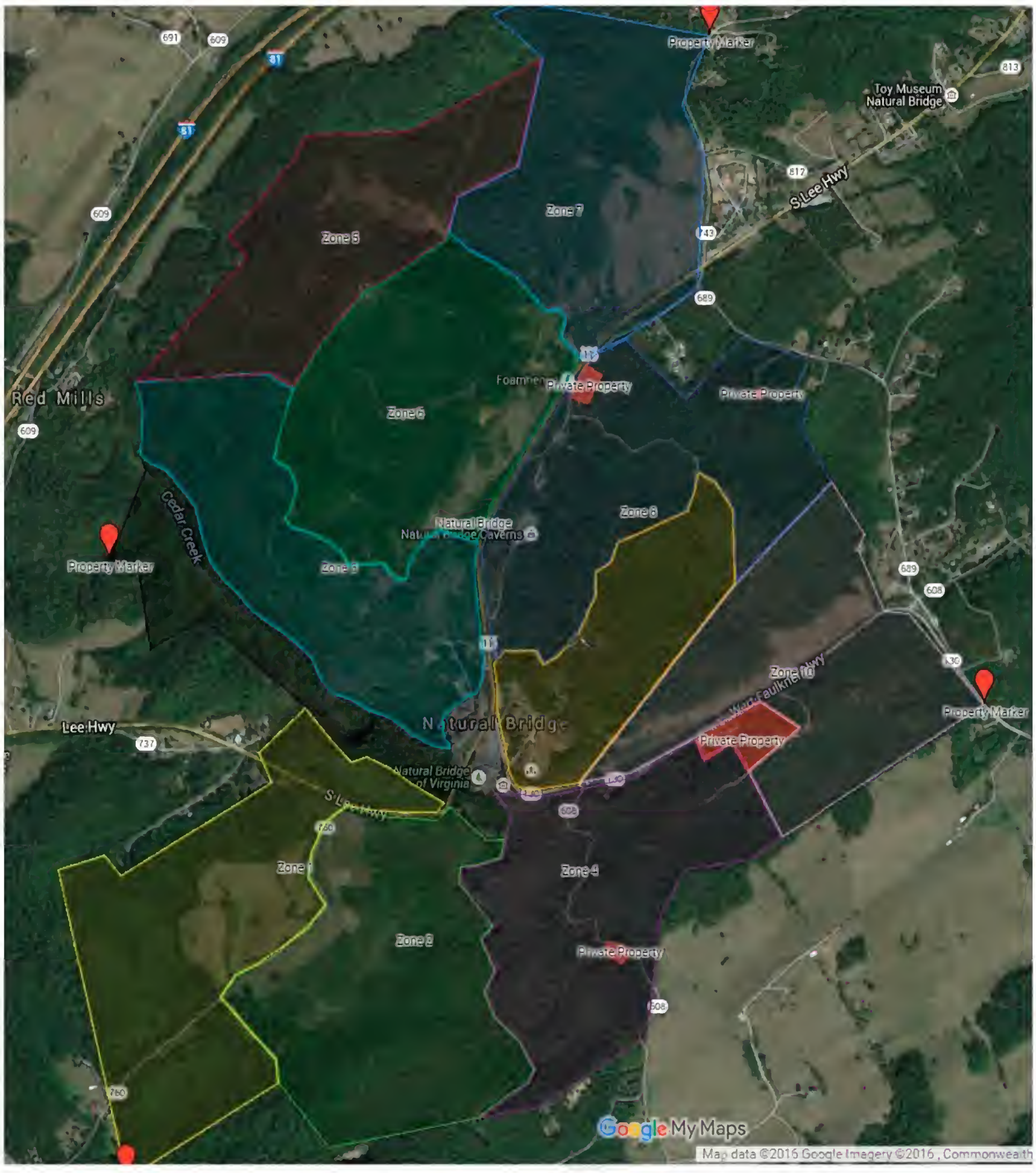


Figure 1 The survey sites within NBP.

MATERIALS AND METHODS

Fifty-six volunteers participated in the survey for approximately 5 hours (from 08:30 to 14:00h), excluding time spent in transit, in the field on 11

June and 21 volunteers participated for

approximately 3 hours (from 9:00 to 12:00h) in the field on 12 June for a net survey total of about 343 person hours (Tables 1 and 2). Due to the large number of participants, 7 survey groups were organized to survey 9 zones within NBP on 11 June (All of the zones as described above). In Site 8, 10 surveyors surveyed for 5 hours and an additional 4 surveyors joined them for 3 hours. Weather conditions were sunny and hot for most of the day, with temperatures ranging from 20° to 35° C. Two survey groups were organized to survey different sections of Site 3 on 12 June. Weather conditions remained sunny and hot.

Prior to each survey, all participant footwear and survey gear (snake hooks, field sticks, dip nets etc.) were disinfected using Nolvasan® Solution (chlorhexidine diacetate). Survey participants on both survey days used multiple collecting methods to find amphibians and reptiles, including visual observation, listening for calling anurans, hand capture and over-turning objects with snake hooks and field sticks. All captured animals were observed to identify possible malformations, injuries or disease and other unique markings and characteristics. Digital photos were taken of some of the captured animals prior to their release at the site of capture. Survey group leaders summarized and submitted all relevant data on VHS survey group data sheets. The following tables summarize the survey effort

Table 1. Summary of the survey effort on 11 June 2016

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
1-Golf Course Road	6	5	**30**
3-Cedar Creek Trail	12	5	**60**
4-State Route 608	11	5	**55**
5-Foamhenge	10	5	**50**
7-State Route 743West	3	5	**15**
8- Caverns	10	5	**50**
8- Caverns	4	3	**12**
10-West Faulkner	4	2	**8**
Total	56	35	**280**

Table 2. Summary of the survey effort on 12 June 2016

Survey Site	No. of Surveyors	Hours	Estimated Person Hours
3-Cedar Creek (East)	12	3	**36**
3-Cedar Creek (West)	9	3	**27**
Total	21	6	**63**

RESULTS

During the 2 days of survey a total of 26 species were captured or positively identified, including 13 amphibians and 13 reptiles (Table 3). The survey produced a total of 4 anuran, 9 salamander, 9 snake, 2 turtle and 2 lizard species. More than 139 animals were captured or positively identified. However, there may be some redundancy in the animal count recorded for Site 3 as this zone was surveyed by one survey group on 11 June and 2 survey groups on 12 June. .

Table 3. Amphibian and reptiles observed at Natural Bridge State Park.

Species/Site	**1**	**3**	**4**	**5**	**7**	**8**	**10**	**Total**
Class Amphibia								
Anaxyrus a. americanus		1	2					**3**
Hyla versicolor						2		**2**
Lithobates catesbeianus		1		2			1	**4**
Lithobates clamitans		2	1	4				**7**
Desmognathus fuscus		10	1				1	**12**
Desmognathus monticola		1						**1**
Eurycea cirrigera		1	1				1	**3**
Eurycea l. longicauda			7	2				**9**
Eurycea lucifuga		9				>21		**>30**
Notophthalmus viridescens		2			2			**4**
Plethodon cinereus			1					**1**
Plethodon cylindraceus			1			1		**2**
Plethodon hoffmani						2		**2**
Total Amphibians	**0**	**27**	**14**	**8**	**2**	**>26**	3	**>80**
Class Reptilia								
Agkistrodon contortrix				1				**1**
Carphophis a. amoenus		2					1	**3**
Coluber c. constrictor		1		2				**3**
Diadophis punctatus edwardsii	1							**1**
Lampropeltis t. triangulum	1							**1**
Nerodia s.sipedon		4	1	1			1	**7**
Pantherophis alleghaniensis		4	1	1				**6**
Regina septemvittata		6	1				1	**8**
Thamnophis s. sirtalis			1					**1**
Chelydra serpentina	1	1					1	**3**
Terrapene c. carolina	2	3	5	5	**1**	**1**	1	**18**
Plestiodon fasciatus		2	1			1		**4**
Sceloporus undulatus	1	1		1				**3**
Total Reptiles	**6**	**24**	**10**	**11**	**1**	**2**	**5**	**59**
Grand Total	**6**	**51**	**24**	**19**	**3**	**>28**	**8**	**>139**

ANNOTATED CHECKLIST

Amphibians

1. *Anaxyrus a. americanus* (American Toad) One adult male American Toad was heard calling in Site 3 and 2 other adults were captured in Site 4 on 11 June. One of the captured toads was in a leafy area next to a creek and some rocks and the other captured adult was on a mossy patch next to a ravine.

2. *Hyla versicolor* (Gray treefrog) Two adult male Gray Treefrogs were heard calling within Site 8 on 11 June.

3. *Lithobates catesbeianus* (American Bullfrog) One adult American Bullfrog was observed in a wetland swamp and another adult male was heard calling from a creek near a bridge within Site 5 on 11 June. One adult American Bullfrog was observed in a pond near the café within Site 3 West on 12 June.

4. *Lithobates clamitans* (Green Frog) One Green Frog tadpole was observed in a creek within Site 3 and 3 adult male Green Frogs were heard calling from a creek within Site 5 on 11 June. Two of these calling males were also seen. One adult green frog was captured under a rock in a creek within Site 4 and appeared to be healthy. A fifth adult Green Frog was observed within Site 5 sitting on a log within the creek. One adult Green Frog was seen next to a creek within Site 3 East on 12 June.

5. *Desmognathus fuscus* (Northern Dusky Salamander) One adult Northern Dusky Salamander was captured from under a rock near a stream within Site 4 and a juvenile Northern Dusky Salamander was captured from under a rock within a stream in Site 10 on 11 June. Ten Northern Dusky Salamanders, a mix of juveniles and adults, were captured from under rocks in a creek in Site 3 East on 12 June and were photographed. All of the Northern Dusky Salamanders captured on 11 & 12 June appeared to be healthy.

6. *Desmognathus monticola* (Seal Salamander) One adult Seal Salamander was captured in the creek within Site 3 East on 12 June, was photographed and appeared to be healthy.

7. *Eurycea cirrigera* (Southern Two-Lined Salamander) One neonate Southern Two-Lined Salamander was observed under a rock within a creek in Site 4 on 11 June. One adult Southern Two-Lined Salamander was captured in a creek within Site 3 and photographed and another adult was captured from a creek within Site 10 on 11 June. The captured adults appeared to be healthy.

8. *Eurycea l. longicauda* (Long-Tailed Salamander) Six adult Long-Tailed Salamanders were observed and captured from under rocks next to a creek bed and an adult Long-Tailed Salamander was observed under a large piece of tin on a concrete slab within Site 4 on 11 June. Two adult Long-Tailed Salamanders were captured from under rocks on the edge of a field and woods within Site 5 on 11 June. All of the captured Long-Tailed Salamanders from both sites appeared to be healthy.

9. *Eurycea lucifuga* (Cave Salamander) More than 30 Cave Salamanders were found during the survey. Seven Cave Salamanders were observed in caverns within Site 3 on 11 June. Six adult Cave Salamanders were captured about 6-7 meters in from the natural entrance, which is above the main commercial entrance, of Natural Bridge Caverns. One adult Cave Salamander was observed in a third cavern chamber about 27 to 28 meters (90 feet) from the natural entrance near no other visible opening. Ten or more neonate Cave Salamanders were observed in a cavern pond and four adults and a juvenile Cave Salamander were found under rocks all near the main cavern entrance within Site 8 on 11 June. All of the captured Cave Salamanders appeared to be healthy. Two adult Cave Salamanders were observed in a cave off the trail within Site 3 West on 12 June.

10. *Notophthalmus v. viridescens* (Red-Spotted Newt) Two juvenile Red-Spotted Newts (Red Efts) were captured in a forest area within Site 7 on 11 June and appeared to

be healthy. Two Red Efts were observed within Site 3 West on 12 June. One was located just off the trail and the other was under a log. All four specimens appeared to be healthy.

11. *Plethodon cinereus* (Eastern Red-Backed Salamander) One adult Eastern Red-Backed Salamander was observed under a piece of large tin resting on a concrete slab, the same tin that covered a Long-tailed Salamander, in Site 4 on 11 June.

12. *Plethodon cylindraceus* (White-Spotted Slimy Salamander) One adult White-Spotted Slimy Salamander was captured from under a rock in the woods near a ravine within Site 4 and a juvenile White-Spotted Slimy Salamander was observed near the natural entrance to Natural Bridge Caverns within Site 8 on 11 June. Both specimens appeared to be healthy.

13. *Plethodon hoffmani* (Valley and Ridge Salamander) Two adult Valley and Ridge Salamanders were captured inside but close to the natural entrance of Natural Bridge Caverns within Site 8 on 11 June. These specimens appeared to be healthy. However, neither specimen could be positively identified during the survey. A later DNA analysis of tail clips confirmed the species identification of these specimens as *Plethodon hoffmani*.

Reptiles

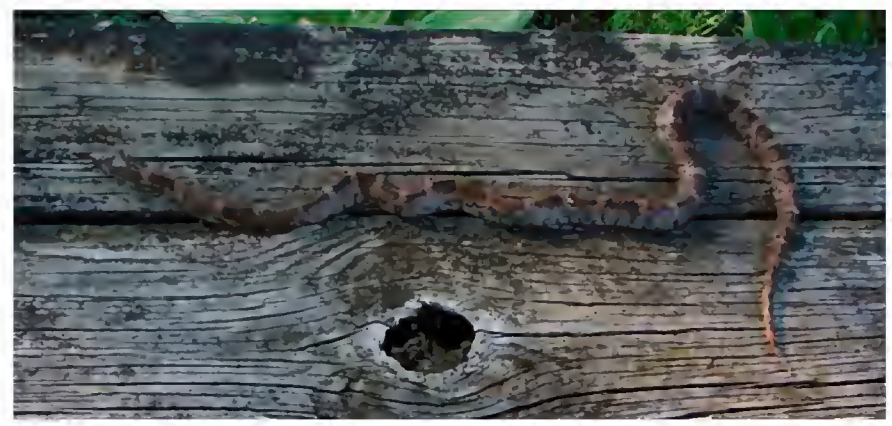
14. *Agkistrodon contortrix* (Eastern Copperhead) One adult Eastern Copperhead was observed coiled on a rocky pile within Site 5 on 11 June.

15. *Carphophis a. amoenus* (Eastern Wormsnake) One adult Eastern Wormsnake was observed under a rock within Site 10 on 11 June. One juvenile and an adult Eastern Wormsnake were captured under rocks along the trail within Site 3 East on 12 June. The captured individuals appeared to be healthy.

16. *Coluber c. constrictor* (Northern Black Racer) One adult Northern Black Racer was observed in an abandoned agricultural field and another was observed basking on a rock near a creek close to Foamhenge within Site 5 on 11 June. One adult Northern Black Racer was observed basking and then crossing the trail within Site 3 East on 12 June.

17. *Diadophis punctatus edwardsii* (Northern Ring-Necked Snake) One adult Northern Ring-Necked Snake was captured under a brick in a poorly maintained shed within Site 1 on 11 June. This snake was photographed and appeared to be healthy.

18. *Lampropeltis t. triangulum* (Eastern Milksnake) One adult Eastern Milksnake was captured under a deep debris pile on 11 June within Site 1. This snake was captured, photographed and retained for group demonstration. This specimen appeared healthy and was released in the late afternoon of 11 June at the debris pile.



19. *Nerodia s. sipedon* (Northern Watersnake) On 11 June, 1 adult Northern Watersnake was captured while swimming in a creek within Site 4. One juvenile Northern Watersnake was observed basking on a rock within a creek near a bridge within Site 5 and another juvenile was observed basking on a rock near the Natural Bridge arch within Site 10. On 12 June in Site 3 West 1 juvenile Northern Watersnake was observed on a log/wood pile in a creek near a cave and

another juvenile Northern Watersnake was observed basking on top of a high wall. An adult gravid female Northern Watersnake was captured near Cedar Creek Trail and a second adult Northern Watersnake was observed in a crevice in a concrete bridge spanning a creek. The captured adult appeared to be healthy.

20. *Pantherophis alleganiensis* (Eastern Ratsnake) On 11 June, one large adult Eastern Ratsnake was observed beneath a tree within Site 3 and was captured. This individual was retained until the end of the 11 June survey, for group observation and measurement. This specimen had an overall length of approximately 180 cm (5.9 feet) and was later released where it was captured. On 11 June the shed skin of an adult Eastern Ratsnake was found on the side of a road within Site 4 and an adult Eastern Ratsnake was observed alongside a creek within Site 5. On 12 June, a juvenile Eastern Ratsnake was captured at the base of a tree near the creek in Site 3 West and 2 adults were captured and photographed in Site 3 East. The first larger adult Eastern Ratsnake was caught while basking on the window sill of a barn and appeared to be healthy. The second smaller adult Eastern Ratsnake was found under a bell behind a greenhouse and had some older scale wounds.

21. *Regina septemvittata* (Queensnake) On 11 June, within Site 3, an adult Queensnake was captured on a branch in a creek, was photographed and appeared to be healthy. A second adult Queensnake was observed basking on a rock within a creek. A third adult was observed in the water and appeared to be somewhat disfigured. Photographs were taken of the disfigured adult. A fourth adult Queensnake was observed and photographed basking in a grassy area by the bank of a creek. Within Site 4, a deceased Queensnake was found in the grass near water. Within Site 10 an adult Queensnake was captured in brush near Natural Bridge was photographed and appeared to be healthy. On 12 June 2 adult Queensnakes were observed basking within vegetation next to a creek within Site 3 West. Both adult Queensnakes appeared to be healthy.

22. *Thamnophis s. sirtalis* (Eastern Gartersnake) One juvenile Eastern Gartersnake was captured in thick underbrush near a creek in a ravine within Site 4 on 11 June. This specimen appeared to be healthy.

23. *Chelydra serpentina* (Snapping Turtle) An adult Snapping turtle was observed in a creek within Site 1 and a juvenile Snapping Turtle was observed and captured in a creek near Natural Bridge within Site 10 on 11 June. The captured juvenile Snapping Turtle appeared to be healthy. An adult Snapping Turtle was observed in a pond near the café within Site 3 West on 12 June.

24. *Terrapene c. carolina* (Woodland Box Turtle) Eighteen Woodland Box Turtles were documented during the survey and at least one individual was recorded in each survey site. On 11 June, an adult female Woodland Box Turtle was captured crossing the road and was photographed and an adult male Woodland Box Turtle was captured in the woods on a bluff above a creek in Site 1. Both specimens appeared to be healthy. In Site 3 the shell of a deceased Woodland Box Turtle was observed in a debris pile on the bank of a creek. In Site 4 two adult male Woodland Box Turtles were captured near each other facing uphill in a dry creek bed. Two adult Woodland Box Turtles were found in leaf litter in a ravine. These 4 specimens appeared to be healthy. Another Woodland Box Turtle was observed in leaf litter and dirt near a creek. In Site 5 one adult male Woodland Box Turtle was captured in a meadow and another adult male Woodland Box Turtle was captured in a wooded area. Two adult male Box Turtles were captured

together on the edge of a field and appeared to be fighting. All 4 adult male specimens appeared to be healthy. One deceased juvenile Woodland Box Turtle was observed next to a log in a field. In Site 7, one adult male Woodland Box Turtle was captured in the forest and its top marginal scute was missing. In Site 8 one adult male Woodland Box Turtle was captured in leaf litter and appeared to be healthy. In Site 10 one adult Woodland Box Turtle was captured next to a log beside the trail behind some caverns. On 12 June, in Site 3 East a deceased adult Woodland Box Turtle was found on the trail and a healthy juvenile Woodland Box Turtle was captured and photographed.

25. *Plestiodon fasciatus* (Common Five-Lined Skink) On 11 June, an adult Common Five-Lined Skink was observed on a tree within Site 3. One juvenile Common Five-Lined Skinks was captured under a concrete rock near the wax museum within Site 4. One adult Common Five-Lined Skink was observed within Site 8 near the caverns. On 12 June, in Site 3 West, a juvenile Common Five-Lined Skink was observed on a concrete walkway over Cedar Creek.

26. *Sceloporus undulatus* (Eastern Fence Lizard) On 11 June, an adult Eastern Fence Lizard was observed on a tree near a turkey nest within Site 1 and an adult Eastern Fence Lizard was observed on the side of the trail within Site 5. On 12 June in Site 3 East an Eastern Fence Lizard was observed basking on a wood pile.

DISCUSSION

During the two day survey of "NBP", the VHS survey groups positively identified more than 139 specimens representing twenty six species (Table 3). There were 13 species of amphibians (4 frogs and 9 salamanders) and 13 species of reptiles (9 snakes, 2 turtles and 2 lizards). However there may be some redundancy in the specimen counts from Site 3 which was surveyed by one survey group on 11 June and the same area by two other survey groups on 12 June, one focused on the east end and the other focused on the west end of Site 3. One species, *Plethodon hoffmani,* could not be positively identified during the survey but DNA testing of tail clips confirmed the species. All of the species encountered had been previously documented in Rockbridge County.

The number of specimens documented is low for a two day survey with a large volunteer participation but is most likely due to the very hot weather conditions encountered during the survey. Salamanders were the most frequently encountered animals during the survey with more than 64 observations, including more than 30 *Eurycea lucifuga.* Snakes were the most frequently encountered reptiles with 31 observations, including eight *Regina septemvittata*. *Terrapene c. carolina* was the most frequently encountered reptile species with 18 observations.

Some of the common amphibian and reptile species previously documented for Rockbridge County that were not encountered include *Ambystoma maculatum* (Spotted Salamander), *Ambystoma opacum* (Marbled Salamander), *Anaxyrus fowleri* (Fowler's Toad), *Chrysemys p. picta* (Eastern Painted Turtle), *Eurycea guttolineata* (Three-Lined Salamander), *Lithobates palustris* (Pickerel Frog), *Opheodrys a. aestivus* (Northern Rough Greensnake) and *Pseudacris crucifer* (Spring Peeper).

All 30 observations of *E. lucifuga* were in caves and caverns with some under rocks. More than 10 neonates were observed in a cavern pond near the main cavern entrance. Six individuals were observed approximately six to seven meters in from the entrance. However, one adult was observed within the third chamber of a cavern in Site 3 about 27 to 28 meters (90 feet) from the entrance. There

were no other visible openings in the vicinity of this specimen. Conant et. al. (1998) reports that a favorite habitat for *E. lucifuga* is in the twilight zone of caves, where light is weak. These salamanders are excellent climbers and move about on the formations and ledges. The twilight zone area of a cave is the area just inside the entrance where there is some light, but not enough for plants to grow (Fawley 2002). They also occur outside of caves and may be discovered beneath logs, stones and debris in wooded or fairly open spaces. Beane et. al. (2010) reports *E. lucifuga* may occur near springs and along rocky brooks under rocks and stones during wet periods. No observations were made outside the caves and caverns during the survey.

Of the species encountered only *P. hoffmani* has a distribution range which is limited primarily to the Valley and Ridge physiographic province. Beane et. al. (2010) reported that the distribution range of *P. hoffmani* in Virginia is north of the New River to Rockingham County.

Eighteen *T. c. carolina* specimens were observed during the survey and were present in every zone surveyed. Group leaders identified the sex of 10 individuals, 9 of which were male with only 1 female identified. Mitchell (1994) cites two Virginia distribution studies for Woodland Box Turtles with sex ratios of 1 male to 2 females among 255 individuals sampled in a mixed hardwood forest in Prince William County and sex ratios of 1.2 males to 1 female, among 50 individuals that were sampled in an open field, hardwood forest and marsh in Fairfax County. It is unclear why only 1 female Woodland Box Turtle was identified during the surveysurvey.

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Natural Bridge State Park Survey

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Dr. Carl H. Ernst 1938-2018

Dr. Carl Henry Ernst passed away on Saturday, November 3, 2018 at the age of 80 years. Born in Lancaster on September 28, 1938, he was the son of the late George Henry and Evelyn Mae (Schlotzhauer) Ernst, and the husband of Dr. Evelyn Marie (Chasteen) Ernst of Leola. He was a member of Covenant United Methodist Church.

Dr. Ernst grew up in the Seventh Ward of Lancaster and graduated from J.P. McCaskey High School in 1956. He went on to earn the B.S. degree from Millersville University in 1960, the M.Ed. from West Chester University in 1963, and the Ph.D., in Vertebrae Zoology, from the University of Kentucky in 1969.

His teaching career began at Hempfield High School, where he taught biology and coached wrestling. While doing research in Lancaster County for his Ph.D., he taught biology courses at Elizabethtown College. Dr. Ernst also taught vertebrae zoology courses and served as the curator of the Vertebrae Animal Collector at the University of Kentucky. Upon leaving the University of Kentucky, he first taught zoology courses at Southwest Minnesota State University, and then for 32 years at George Mason University in Fairfax, Virginia. There, Dr. Ernst taught graduate vertebrae zoology and ecology courses, and served as Chairman of the Department of Environmental Science and Policy. During his tenure at George Mason University as a full Professor of Biology, he directed the graduate degrees of 51 Master's students and 20 Ph.D. students, and was named the Distinguished Professor of Herpetology by the University in 1986.

Dr. Ernst served as a Research Associate in the Division of Amphibians and Reptiles, Department of Zoology, Smithsonian Institution from 1972 until his death. An accomplished researcher on snakes and turtles, he published over 240 scientific papers in peer-reviewed science journals and authored 11 books. Two of his books earned national honors. He was awarded the Outstanding Publication of the Year in Wildlife Ecology and Conservation by the Wildlife Society for two editions of "Turtles of the United States" in 1972 and 2011; equivalent to the Pulitzer Prize in this field, and a singular honor to be awarded twice. The 1992 book, "Venomous Reptiles of North America," was named the Natural History Book of the Year by the American Library Association. Several of his other books were also nominated for national awards. During his research career, Dr. Ernst discovered and named five turtles and a parasitic worm new to science, and was recognized as an international expert on turtles. The Escambia Map Turtle, Graptemys ernsti, was described and named in his honor by one of his former graduate students. A "Biographical Sketch and Bibliography of Carl H. Ernst" was published by the Smithsonian Herpetological Service (No. 150) in 2016 (https://repository.si.edu/handle/10088/29561).

Other honors bestowed upon him during his career included being named a full member of the research association, The Society of the Sigma Xi, in 1968 while still a graduate student at the University of Kentucky, only the second student at the University to be so honored with full membership. He became a Fellow of the Herpetologists' League in 1971, and in 1992 was named the first Distinguished Alumni Fellow in the Sciences at Millersville University. His career was capped by being nominated as International Scientist of the Year in 2003.

After his retirement from George Mason University in 2004, he returned to Lancaster County and became heavily involved with his church, and served on several Alumni committees at Millersville University. A popular speaker, he gave several talks on

venomous snakes and turtles at Millersville University and the North Museum. He received Distinguished Alumni Awards from both McCaskey High School and Millersville University.

In addition to his wife, surviving Dr. Ernst are his daughters Lydia Ann, wife of Paul W. Dengel, Lynbrook, New York; and Carol Marie-Ernst, wife of Terry Creasap, Stafford, Virginia; and his grandchildren, Emma St Clair Robertson, Luke Henry Robertson, Harrison Wells Dengel, Hayden Augustus Dengel, Brennan Taylor Creasap, and Brayden Tyler Creasap.

Carl was a loving husband, devoted father, and proud grandfather. He lived his life by example, pursuing excellence in all things with determination and persistence. Gifted with a phenomenal memory; a remarkable taxonomic mind; and a unique ability to understand people, places, and events in the larger context of time and history; he valued each minute of his life and was a worthy steward of his time and talents. He will be greatly missed.

*Obituary originally published at https://www.debordsnyder.com/dr-carl-h-ernst/ and used with permission of Ernst family.

***Lithobates palustris* (Pickerel Frog).** VA: Greene County, Greene County Community Park (38° 16' 23.9520" N, 078° 24' 56.5560" W). 11 May 2018. David Weisenbeck, Matt Graziano, and Alexandria Pahides.

County Record Confirmation: The Virginia Herpetological Society (VHS) maintains a database of statewide distribution records for all species of amphibians and reptiles known from Virginia. These maps are populated with data derived from the Virginia Department of Game and Inland Fisheries (https://vafwis.dgif.virginia.gov/fwis/) and from member observations. Distribution maps such as these provide an excellent resource for scientists and citizens alike. The Pickerel frog, *Rana (Lithobates) palustris,* is known to occur throughout most of Virginia, with the exception of a gap in occurrence in Greene county (http://virginiaherpetological society.com/amphibians/frogsandtoads/ pickerel-frog/pickerel_frog.php). This same distributional gap is recorded by Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries), and Tobey (1985. Virginia's Amphibians and Reptiles: A Distributional Survey. Virginia Herpetological Society, Purcellville, VA. 114 pp.).

VertNet (http://vertnet.org/) is a free online resource providing biodiversity data drawn from a consortium of hundreds of biocollections. Records from VertNet indicate that four specimens from Greene County exist in the collections of The Carnegie Museum of Natural History (CM 121287, CM 121288, CM 121289, CM 121290), collected by C. Bayne and L. Rice in 1969. Identification of these specimens were independently confirmed by S. Rogers (Pers. Comm) and the authors to be *L. palustris*.

In an effort to confirm that *L. palustris* populations persist in Greene County, we conducted field surveys at Greene County Community Park during 2018. An adult specimen was collected (VDGIF permit no. 059179) at 1740hrs, 11 May 2018 at the edge of a stream running through the park. The specimen (JMUFS 0001) was euthanized using tricaine methanesulfonate (MS-222; Simmons, J.E. 2015. Herpetological collecting and collections management. Society for the Study of Amphibians and Reptiles Herpetological Circular 42: 1–191.) in accordance with JMU IACUC protocol A15-15. Samples of liver tissue were collected and stored in RNAlater (Invitrogen). The specimen was fixed in 10% neutral buffered formalin and later transferred to 70% ethanol. Specimens and tissue samples were deposited in the North Carolina Museum of Natural Sciences (NCSM 100136). Identity of the specimen was confirmed by Dr. David McLeod. This record confirms the occurrence of *L. palustris* in Greene County, Virginia. Based on our findings, we recommend the use of additional resources (i.e. Vertnet) for verifying species distributions in Virginia.

David Weisenbeck, Matt Graziano, and Alexandria Pahides
James Madison University
Harrisonburg, VA 22807

***Lithobates sylvaticus* (Wood Frog).** VA: Clarke Co., Duke Hollow (private property), approximately 300 m north of the Appalachian Trail, or 3 km east of Rt. 50, 20 October 2018. Raymond Barbehenn.

County Record: An audio recording of a group of calling wood frogs was made at a breeding pool (2-3 m diameter) on 25 February 2017. The pool (Fig. 1) is situated in a wet area approximately 10 m from a creek-fed pond in the moist woods of Duke Hollow. A single adult (Fig. 2; VHS Archive #502) was found on the afternoon of 20 October 2018. It was on the hillside within 20 m of the breeding pool. The frog was sitting in the leaf litter. This observation shows that *L. sylvaticus* has a continuous distribution across the counties of northern VA.

Raymond Barbehenn
Department of Ecology and Evolutionary Biology
University of Michigan
Ann Arbor, Michigan (retired)

Figure. 1. Breeding pool for *L. sylvaticus* in Duke Hollow (Clarke Co.)

Figure. 2. *Lithobates sylvaticus* in Duke Hollow (Clarke Co.).

***Lithobates sylvaticus* (Wood Frog).** VA: Clarke Co. Forested ridge, private residence's yard, Russell, VA. (39.197 N, 78.071 W). 19 April 2019. Miranda McCleaf.

County Record: *Lithobates sylvaticus* (Wood Frog) One adult Wood Frog was observed on a cement front porch in Clarke Co, subsequent to a torrential downpour and flash flooding events which occurred earlier the same evening; 19 April, 2019. Whereas this species has been documented in nearby Frederick Co, as well as neighboring Loundon, Warren and Fauquier Counties, it is not currently listed as occurring in Clarke Co. This observation provides evidence of the species occurring in a distribution gap of the known range. A digital photo was submitted (# 518) as a voucher for this observation.

Miranda McCleaf
Berryville, Virginia

Siren intermedia intermedia (Eastern Lesser Siren) Virginia, Sussex County. 29 March 2018 Big Woods Wildlife Management Area. Dane Conley, Lauren Jurczak.

Country Record: The Eastern Lesser Siren (*Siren intermedia intermedia*) occurs in seven counties in Virginia: Caroline County, Hanover County, Isle of Wight County, King William County, Prince George County, Southampton County, and Suffolk City. (Virginia Herpetological Society. *Eastern Lesser Siren)*. On March 29th 2018 while trapping for Spotted Turtles (*Clemmys guttata*), a large aquatic salamander was found in a pro-mar trap. The trap is typically used for trapping crayfish, and resembles the much larger hoop nets used for trapping larger turtles. The bait used was canned sardines put in the day before. This could be potential evidence that these salamanders will feed on deceased fish in Virginia. The water depth was ~15cm. The salamander was kept overnight for proper identification and photos. The salamander was not measured but estimated to be about ~30cm. The costal grooves were photographed and counted, which turned out to be 31. This identified the salamander as a Lesser Siren (*Siren intermedia intermedia*), which was verified by Virginia State Herpetologist, J.D. Kleopfer. The salamander was released back where it was caught in a seasonal vernal pool that was surrounded by a recently burned Loblolly Pine (*Pinus taeda*) forest. The Eastern Lesser Siren is rarely seen due to its secretive nature and its mostly active within murky swamps and ponds. This record its supportive of its range map in Virginia and connects the gap between Prince William County and South Hampton County, Virginia. This species is a Tier III for the Virginia Wildlife Conservation Plan, which makes understanding and updating their known range and recent records beneficial for efficient conservation of this species.

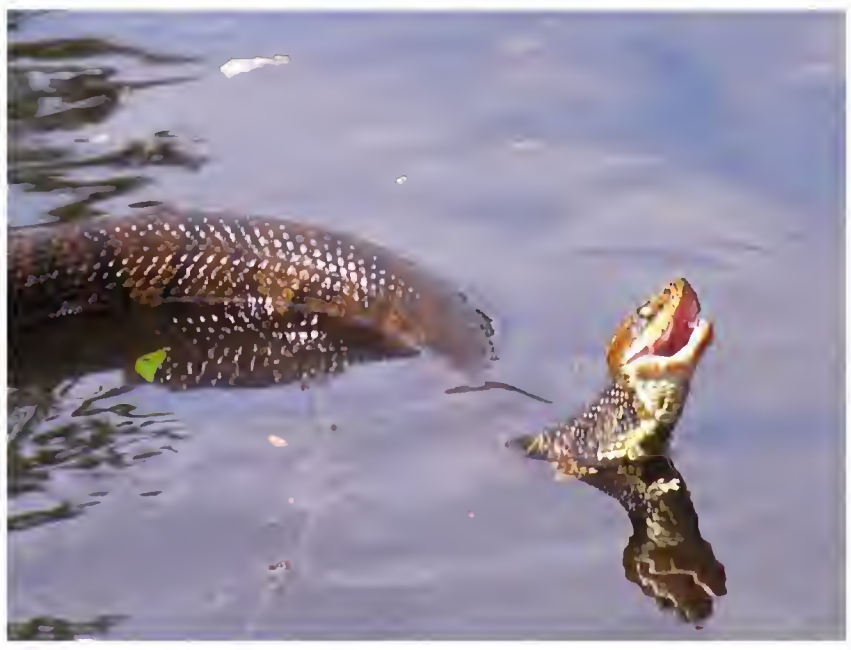
Dane Conley
Virginia Department of Game and Inland Fisheries
3801 John Tyler Highway
Charles City, Va. 23030

Lauren Jurczak
Virginia Commonwealth University
1000 West Cary St.
Richmond, Virginia 23284

***Agkistrodon piscivorus piscivorus* (Northern Cottonmouth) VA** Isle of Wight County (36° 40' 26.11" N; 76° 54' 8.55" W) March 2013. Jeff Turner.

County Record: The snake picture below was taken March 2013 in Washole Creek just downriver from the mill near Franklin. This is an important submission because there are no other reports for the Cottonmouth listed in Isle of Wight County by the VHS or DGIF. I have seen many cottonmouth in my 50 years of being on the Blackwater in Isle of Wight County, I just do not have documentation for the other observations. The Northern Cottonmouth is reported from Surry County to the west, Newport News City to the east, and Suffolk City to the south. The photo was submitted to the VHS Archive as a voucher (# 519).

Jeff Turner
Blackwater Nottoway RiverGuard



***Coluber constrictor constrictor* (Northern Black Racer)** VA: Henry County, Patrick Henry Community College, 645 Patriot Avenue (36°44'32.82"N, 79°52'35.20"W). 18 April 2019. Wylie Martin, Jason D. Gibson, and Jason L. Worley

County record: The Black Racer is a diurnal snake that is widely distributed throughout the state of Virginia (Tobey, F.J. 1985. Virginia's Amphibians and Reptiles: A Distributional Survey. Virginia Herpetological Society, Purcellville, VA. 114 pp., and Mitchell, J.C. and K.K. Reay. 1999. Atlas of Amphibians and Reptiles in Virginia, Special Publication No.1, Virginia Department of Game and Inland Fisheries, Richmond, VA, 122 pp.). The most current map of Black Racer distribution on the VHS website shows only 12 counties in the state lacking records for this species.

While conducting a survey of the Patrick Henry Community College campus and also collecting road observations since 2017, we have seen a mixture of 11 live and dead Black Racers throughout Henry County, Virginia. These observations represent a county record for this species and helps reduce the number of counties lacking observations of this snake to 11. We observed snakes in open grassy habitats, mixed pine-oak forests, in clear cuts with young re-planted pines, beside ponds, and on roads going through these habitats. Nine of our observations were of road killed adult snakes, one snake was observed alive on the road and one snake was found alive on the campus of Patrick Henry Community College. Snakes were observed from 27 March through 5 July. Nine observations were in the month of April and ranged from 4 April until 20 April. Mitchell (1994, The Reptiles of Virginia. Smithsonian Institution Press, Washington D.C. 352 pp.) reports mating behavior from 10 April through 8 June in Virginia. Ernst and Ernst (2003, Snakes of the United States and Canada.

Smithsonian Books, Washington D.C. 668 pp.) suggest that most annual activity for this species is recorded in the spring and this is most likely due to males seeking females. Our large number of DOR snakes observed in April may represent males searching for females.

This work was conducted under the VDGIF collecting permit #064948. A digital photo voucher has been deposited in the VHS digital archives (#517).

Wylie Martin, Jason D. Gibson, and Jason L. Worley
Patrick Henry Community College
STEM Division
645 Patriot Avenue
Martinsville, VA 24112

***Heterodon platirhinos* (Eastern Hognose Snake)** VA: Northumberland County, 1269 Pumpkin Hill Road, Burgess VA (N37,52,354 W76,22,065) 28 September 2018. Temple Moore

County record: The Eastern Hognose Snake (*Heterodon Platirhinos*) has a wide distribution in Virginia. There are verified records from throughout the state. I believe this report is the first record of an Eastern Hognose Snake for Northumberland County. On 28 September 2018 at approximately 1600h, I found an Eastern Hognose in the lily beds on our farm in Northumberland County. The species has not been reported in Northumberland County in Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia. Special Publication Number 1, Virginia Department of Game and Inland Fisheries, Richmond ,VA) or Mitchell (1994, The Reptiles of Virginia, Smithsonian Institution Press, Washington DC . 352 pp). I have reported this species previously to VADGIF for the Wildlife Mapping program but without a photograph. There are previous reports of the Eastern Hognose Snake from Westmoreland County to the north and Lancaster County to the south. A digital photo of the specimen was submitted to Mike Clifford for verification, and the VHS Archive as a voucher (# 521).

Temple Moore
Burgess VA

***Storeria dekayi (*Dekay's Brownsnake)** VA: Fluvanna County, 316 Taylor Ridge Way, Palmyra, 08 May 2019, David Perry

An adult Dekay's Brownsnake was found at 13:30 h coiled in fig tree leaf mould in the vegetable garden on the eastern side of our property at 316 Taylor Ridge Way. Skies were partly cloudy but the sun was shining and the afternoon temperature was 25°C (77°F). The Brownsnake measured 25.4 cm (10 inches).

The adult Brownsnake was observed for approximately 3 hours and was then released in a tall grass field, a short distance from the point of capture.

According to Mitchell and Reay (1999, Atlas of Amphibians and Reptiles in Virginia, Special Publications Number1, Virginia Department of Game and Inland Fisheries, Richmond VA pp 96) and Virginia Herpetologial Society county records of 08 May 2019 ***Storeria dekayi*** has not been previously recorded in Fluvanna County although it has been found in adjacent counties to the west (Albermarle), to the north (Louisa) and to the east (Goochland).

Digital pictures of the specimen were submitted to the VHS archives (Archive #522)

Joanne F. Perry and David A. Perry
316 Taylor Ridge Way, Palmyra, VA 22963

Storeria dekayi (Dekay's Brownsnake). VA: Franklin County. Moneta, VA, 37.119, -79.674. 23 April 2019. Robert Sanders

County Record: Dekay's Brownsnake is common in eastern Virginia and has a scattered distribution in western counties. This is the first record for the species in Franklin County. It has been reported in surrounding counties to the south (Patrick, Henry and Pittsylvania) so this report helps fill a distribution gap. A photograph of the snake was submitted to the VHS Archive (# 523) as a voucher. The snake was observed in my front yard around 5:00 PM. The weather was unseasonably warm (30° C), sunny, but not humid.

Robert Sanders
610 Periwinkle Rd.
Moneta, VA 24121

***Tantilla coronata* (Southeastern Crowned Snake)**. VA: Franklin Co., Rocky Mount, Grassy Hill Natural Area Preserve. Forest just south of powerline in management area off of Thimble Lane Road (36.999595 N, 79.91865 W). Elevation 1259′ (384 m). 25 May 2019. Austin Smith, Nell Fredericksen, Todd Fredericksen.

County Record: On 25 May 2019 at 1030 h, a Southeastern Crowned Snake (*Tantilla coronata*) was captured under a log by Austin Smith on a field trip with a herpetology class from Ferrum College. The capture was within a mature mixed hardwood forest stand with an abundance of large rocks and fallen logs. This appears to be the first capture of this species in Franklin County (FWIS website, VHS website), although it is found in adjacent Pittsylvania County to the west and Henry County to the south. Weather conditions at the time of capture were sunny and warm 24° C (75° F). There had been little rainfall in the days preceding the capture. Total length of the snake was 21 cm. It was released at the site of capture. Archived photo (#524) is included as a voucher.

Todd Fredericksen
Ferrum College
Ferrum VA, 24088

Pseudemys concinna concinna (Eastern River Cooter) VA: Culpeper County, River Road about 0.8 km west of Bushy Mountain Road (38.347402 N, 77.982473 W), 19 August 2018, James Fox.

County record: While driving along River Road along the Rappahannock River around 11 a.m. I noticed two larger turtles on a log on the opposite side of the river. I identified both as Eastern River Cooters (Pseudemys concinna concinna). Several photographs were obtained to document the sighting. The Rappahannock River is the county line between Orange and Culpeper Counties at this location, so while I observed the turtles from the road on the south side of the river in Orange County, they were on a log next to the bank on the Culpeper side, so they were in Culpeper County. This is the first record of the Eastern River Cooter for Culpeper County and helps fill a gap in the distribution between Fairfax and Prince William Counties to the north and Albemarle County to the south. A digital photo was submitted to the VHS Archive (# 525) as a voucher.

James Fox

Pseudemys rubriventris (Northern Red-bellied Cooter) VA: Page County, Kauffmans Mill Road (38.656785 N, 78.539351 W), 18 August 2018, James Fox.

County record: While driving along the portion of Kauffmans Mill Road that skirts the Shenandoah River around 9 a.m. I noticed two turtles on a long on the opposite side of the river. The smaller one was a Painted Turtle (Chrysemys picta picta) and the larger one was a Northern Red-bellied Cooter (Pseudemys rubriventris). A photograph (Archive # 526) was obtained to document the sighting. This is the first record of the Northern Red-bellied Cooter for Page County, although this species has been recorded in most other counties the Shenandoah River passes through, so it is not unexpected.

James Fox

***Molecular confirmation of* Ophidiomyces ophidiodiicola *in* Crotalus horridus *and* Agkistrodon contortrix**. Allegany County, Maryland and Rappahannock County, Virginia. (Latitude and longitude excluded). 30 March and 16 May 2019. Todd A. Tupper, Lauren D. Fuchs and Robert Aguilar.

Snake fungal disease (SFD) has been associated with widespread morbidity and mortality in over 30 North American snake species (Tetzlaff et al. 2015. First report of snake fungal disease from Michigan, USA involving massasaugas, *Sistrurus catenatus* [Rafinesque 1818]. Herpetology Notes 8: 31-33). *Ophidiomyces ophidiodiicola* (*Oo*), is the known etiologic agent of SFD (Allender, et al., 2015. Development and use of a real-time polymerase chain reaction assay for the detection of *Ophidiomyces ophidiodiicola* in snakes. Journal of Veterinary Diagnostic Investigation 27:217–220), but the distribution of *Oo*, its precise mechanisms of infection, and its long-term impact on North American snakes are poorly understood (Hileman et al. 2018. Estimation of *Ophidiomyces* prevalence to evaluate snake fungal disease risk. Journal of Wildlife Management 82:173–181). Here we report instances of confirmed SFD in Allegany County, Maryland (in Timber Rattlesnake [*Crotalus horridus*]) and Rappahannock County, Virginia (in Timber Rattlesnake and Eastern Copperhead [*Agkistrodon contortrix*]).

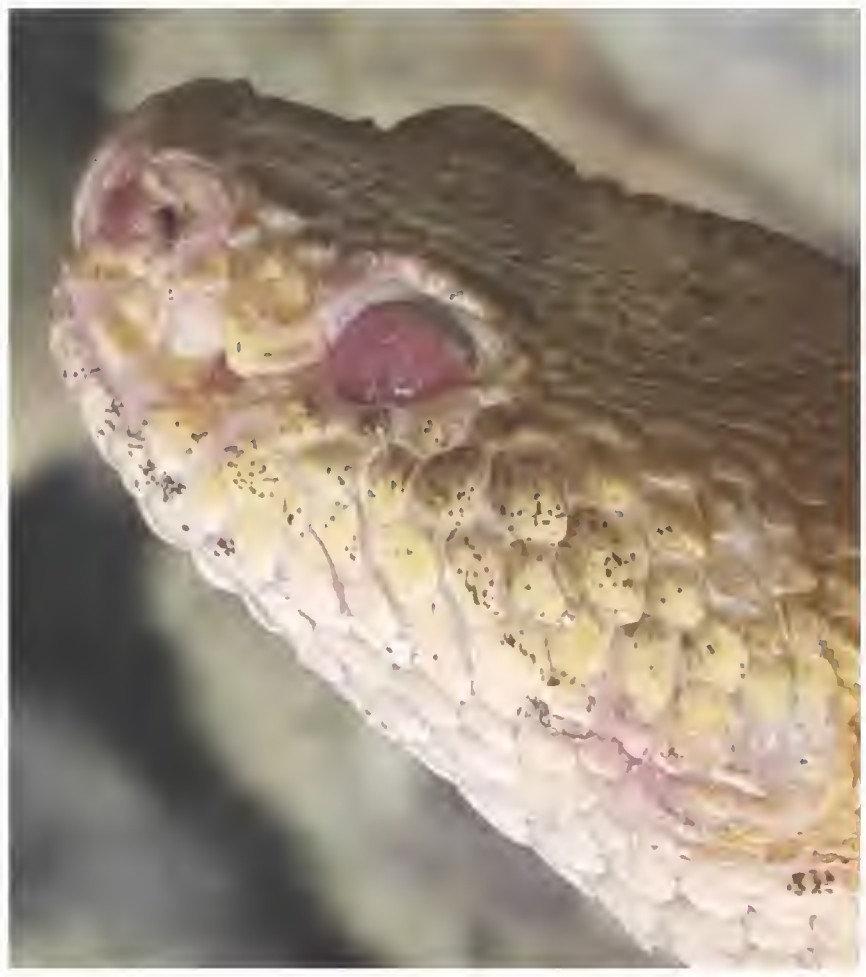
On 17 May 2017 we reported observations of symptoms consistent with a severe snake fungal disease infection in a Timber Rattlesnake in Allegany County, Maryland (Tupper et al. 2017. Snake fungal disease in *Crotalus horridus* MD: Allegany County. Catesbeiana 37:128-130). However, this individual was not swabbed and molecular confirmation of *Oo* was not possible. On 16 May 2019 (14:00-18:00 hrs; max daily temperature = 27.2 ºC) we revisited the same location and found 22 Timber Rattlesnakes, one of which was lying coiled next to its newly molted skin (the pattern of lesions and markings were identical between the two; and lymphatic fluid was present on the shed skin, shed lesions, and remaining lesion scars). Of the 22 snakes, six appeared symptomatic for moderate to severe SFD infection. Symptoms were present throughout the bodies and heads; the lesions

of one individual were so severe that there was blood and lymphoimmune fluid present in three subcaudals and the proximal rattle. The ocular region of two other individuals were damaged. The damage to one of these individuals appeared to be more superficial than the other— that is, severe hyperkeratosis appeared in the right spectacle, but it was unclear if the underlying eye was impacted. The other ocular-damaged Timber Rattlesnake had a degenerated spectacle and damage to the underlying eye itself. Various craniofacial scales, dorsolateral body scales, and a range of ventral scales (from the mentals to the subcaudals) were also affected across other symptomatic individuals. Using methods described in Fuchs et al. (*In review*. Investigation of Snake fungal disease at two natural areas in Anne Arundel County, Maryland and Fairfax County, Virginia, USA. Amphibian and Reptile Conservation), we swabbed all symptomatic snakes (including the molt) and used qPCR to test for the presence of *Oo*. Five of the six symptomatic snakes were *Oo* positive. The *Oo* negative snake was newly molted, however, its molt was positive. Due to an abnormal extraction of the negative sample, we are uncertain if this non-detection represents a false negative, or a true absence of *Oo* DNA. Regardless, the newly molted individual showed widespread scarring on the head and body, and (as previously described) its right eye was severely compromised from the prior infection (Fig. 1).

On 30 March 2019 in Rappahannock County, Virginia (16:00-19:00 hrs; max daily temperature = 25 ºC) we observed an Eastern Copperhead basking, and a Timber Rattlesnake molt (most likely from the prior season) at a hibernaculum. The Eastern Copperhead appeared to be relatively healthy, showing typical signs of overwintering stress (slightly thin and dehydrated, with some minor scale abnormalities; Costanzo 2011. Effects of humidity, temperature, and submergence behavior on survivorship and energy use in hibernating garter snakes, *Thamnophis sirtalis*. Canadian Journal of Zoology 67:2486-2492). However, one prominent dorsolateral nodule approximately midway down its body (SVL) raised our suspicion and prompted us to swab the snake. There were no obvious lesions on the Timber Rattlesnake molt, but we retained it for analysis. We revisited the hibernaculum on 3 May 2019 (16:00-19:00 hrs; max daily temperature = 28.9 ºC) and found eight Timber Rattlesnakes basking. They appeared to be relatively healthy, considering seasonality. However, one presented prominent craniofacial lesions with moderate crusting of the mentals, infralabials and chin shields—all of which were swabbed. Our analysis (using methods cited above) showed that the Eastern Copperhead, Timber Rattlesnake and Timber Rattlesnake molt from Rappahannock County were *Oo* positive.

Our work represents the first confirmed accounts of *Oo* related SFD infection in Timber Rattlesnake in Maryland and Virginia, and in Eastern Copperhead in Virginia. Our findings increase the number of confirmed infected species to six and 10 in Maryland and Virginia, respectively (*see* Fuchs et al. *In review*. Investigation of Snake fungal disease at two natural areas in Anne Arundel County, Maryland and Fairfax County, Virginia, USA. Amphibian and Reptile Conservation). Considering how little is known about SFD, and that data suggest it may be especially detrimental to certain species (Lorch et al. 2016. Snake fungal disease: an emerging threat to wild snakes. Philosophical Transactions of the Royal Society B 371:20150457), we recommend that all researchers, volunteers and recreational herpetologists regularly use a 10% bleach solution to disinfect footwear and equipment. We also suggest not handling

snakes unless necessary until more is known about the disease.



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The President's Corner

Greetings fellow herp enthusiasts,

The Virginia Herpetological Society (VHS) has had a busy 2019 that started while we still had snow on the ground. John Orr organized a group of our members for a behind-the-scenes tour at the Reptile Discovery Center at the National Zoo in DC lead by myself and for a special "Dragon Tour" featuring reptiles and amphibians at the National Gallery of Art, led by Bela Demeter (former biologist at the National Zoo). Thanks John and Bela for making this event a success.

We have also had a successful spring season with three surveys so far: Amelia Wildlife Management Area in April and May, Sky Meadows State Park in May, and BioBlitz at Richmond National Battlefield Park in June. On 15-16 June, we had our HerpBlitz at Featherfin Wildlife Management Area. We had 12 volunteers on each day, observed 15 species representing 63 individual animals. We will have our fall surveys covering a different area of Appomattox and Buckingham State Forests.

Our Secretary, Dave Perry, led our survey at Amelia Wildlife Management Area on 28 April and 5 May, 2019. The purpose of the survey was to provide Virginia Department of Game and Inland Fisheries (VDGIF) with an inventory of amphibian and reptile species located there with special emphasis on species with conservation status of Tier I-IV. Over both days we had 22 volunteer herpers that uncovered 26 species of herpetofauna (14 amphibians and 12 reptiles). Noteworthy species included three with VDGIF tiered conservation status, Tier-lll Woodland Box and Tier-IV Eastern Hog-Nosed Snake and EAstern Spadefoot. Thanks Dave for leading the survey and thanks to Pete Schula, Jimmy Stinson and Katie Martin for allowing VHS to survey AWMA.

I led the Annual Spring Survey at Skymeadows State Park on 18-19 May 2019. This park is located in Fauquier and Clarke Counties which have never been surveyed by the VHS before and we hoped to find new county records of herpetofauna. In total, we had 83 herp volunteers in attendance and we found 275 individuals of 29 different species. We also documented three new county records for Fauquier Co.: American Bullfrog, Eastern Musk Turtle, and Pickerel Frog. Thanks to everyone that came out and a special thanks to Tim Skinner, Sky Meadows State Park Manager, for all his assistance and gracious hospitality as well as the site leaders we had on our surveys: Dave Perry, Kory Steele, Paul Sattler, Matt Close, Yohn Sutton, Larry Mendoza, Travis Anthony, and Michael Kirby.

We are still awaiting numbers and totals of herpetofauna uncovered on the BioBlitz at Richmond National Battlefield Park that occured 8 June 2019.

You may also notice some changes as well. In our Fall 2018 issue of Catebeiana, Volume 38 Number 2, we updated our formatting. Thanks to our Catesbeiana editors Paul Sattler and Matt Becker for working on this. It looks great! This past spring meeting we also voted on a new VHS logo to feature Virginia's state snake (Eastern Gatersnake) and state salamander (Red Salamander) from our logo contest entries. Our contest winner was Ayla Elliott. Ayla will be awarded $150 and an annual membership to the VHS.

We have some extra funds thanks to some generous donations and increased membership (more on that in a bit) so we are helping VDGIF with funding their re-print of their popular Snakes and Lizards of Virginia Guide. We have also bought some

more supplies (snake hooks and turtle traps) to use at our surveys to help increase the number of herps that we find. We have also increased our educational outreach events, a big thanks to Larry Mendoza for staffing most if not all of these, so we have bought a few more educational items to help draw attention to our tables (banners, pens, and stickers) as well as some updated traveling enclosures for Larry to safely feature some of his snakes.

And last, but certainly not least, our membership is at an all time high! We currently have 328 members. A big thanks goes to our Outreach Coordinator, Mike Salotti for organizing these memberships and an especially big thanks to you all for being a part of the VHS. I hope to see you at one of our upcoming surveys or at our fall meeting.

Matt Neff
VHS President

Virginia Herpetological Society
Annual Spring Business Meeting
5/17/2019
Minutes of Meeting

Matt Neff, President of the Virginia Herpetological Society (VHS), opened the meeting at approximately18:30 hr. EDT and provided the agenda for the meeting. VHS and VHS Executive Committee Members (Ex-Com), Travis Anthony, Mitch Bowling, Michael Carr, Erin Chapman, Matt Close, Jason Gibson, Larry Mendoza, Dave Perry, Gene Sattler, Paul Sattler, Emily Steele, Kory Steele, Yohn Sutton, Joe Vellari, David Van Gelder, Charise White and John White also participated in the meeting.

1. Surveys

a. Supplies, traps…
Matt Neff mentioned that VHS had purchased 8 turtle hoop traps which are currently in the possession of Travis Anthony, VHS Vice President, and will be split-up among VHS Survey Group Leaders. Some attendees suggested that VHS should also consider buying cover boards for future surveys. However, it was also noted that cover boards would need to be placed well in advance of the survey to be effective.

b. Amelia WMA
Dave Perry, VHS Secretary and Conservation Committee Chair, provided the results of the 4/28 and 5/5 2019 surveys of Amelia WMA. Twenty six species were observed including 3 tiered species, Tier IV Eastern Hog-nosed Snake, Eastern Spadefoot and Tier III Woodland Box Turtle. Three potential new Amelia County records were also observed, American Bullfrog, Eastern Spadefoot and Squirrel Treefrog, but the calling males were not recorded and therefore remain un-documented. Jason Gibson, VHS Survey Committee Chair, suggested that in the future audio recordings could be captured by cell phone and transmitted as a file to Paul Sattler, VHS Journal Editor, to document calling males.

c. Bioblitz, Richmond National Battlefield
Bioblitz 2019 –Richmond National Battlefield Park is scheduled for Saturday June 7. Registration is required and can be done on the VHS website. Travis Anthony will attend and lead the herp survey efforts in Mechanicsville.

d. HerpBlitz, Feattherfin WMA
The 2019 14th annual HerpBlitz will be conducted on Saturday June 15 and Sunday June 16. Registration is required via email to Jason Gibson.

e. Fall Survey?
Travis Anthony will coordinate and lead the VHS Fall survey which will most likely be a follow-up to the 2018 survey at Appomattox State Forest.

f. Follow-up
First drafts of survey reports for Natural Bridge (2016) and Lake Anna (2018) State Parks have been submitted to Paul Sattler for editing. The Newport News Park Bioblitz (2017), The Cedars Natural Area Preserve (2018) and Appomattox State Park (2018) survey reports are in progress.

g. Anyone Else?
Matt Neff presented a Virginia County Map with counties surveyed by VHS in color coded circles representing the decades during which VHS conducted a survey. Only a very few counties have not been previously surveyed by VHS and some such as Orange County do not have any public lands. Joe Vellari asked if VHS would conduct surveys on private lands and Matt Neff gave the example of the past survey of the Quarry Gardens in Schuyler as a private property survey completed by VHS. It would be helpful to identify private land survey opportunities in counties like Orange County. A list of counties not previously surveyed by

VHS will be provided by Matt Neff to the Ex-Com.

2. License Plates

Travis Anthony explained that VDGIF would be sponsoring a Northern Red Salamander for a conservation license plate. A minimum of 450 applications are required to initiate the legislative process for a new plate, which is a requirement beyond VHS capability. Travis relayed an email provided by Susan Watson, VHS Permits Committee Chair who was unable to attend the meeting, concerning the Northern Red Salamander license plate. Susan reports that the artist for the new license plate will be Ayla Elliott, the winner of the 2019 VHS logo contest. She will begin the project after the VDGIF Outreach Director has established a payment process for her artwork. J.D. Kleopfer, Herpetologist for the Commonwealth of Virginia, has agreed to fund the artwork from his budget. Ayla plans to donate the first draft and will charge $50 per revision. Susan has suggested and Ayla has agreed to position the salamander on a clump of moss and to add a piece of native vegetation, perhaps mountain laurel, on the other side of the plate. Due to space constraints the salamander may look a little different than the one proposed for the new VHS logo. Due to VDGIF human resource constraints and other issues, the project will most likely commence after July first.

3. Catesbeiana

a. Updates on the spring issue

Paul Sattler indicated that the draft submissions of survey reports for Lake Anna and Natural Bridge State Parks and the pending progress of the survey reports for The Cedars Natural Area Preserve, Newport News Park BioBlitz and Appomattox State Forest will help fill the spring and fall 2019 editions of Catesbeiana. However, Paul noted that not many field notes are available for publication in the spring edition and suggested that perhaps the later publishing date for the 2018 fall edition included some field notes that would have been published in past years spring editions.

b. Sending to museums and libraries only

Paul moved that due to postage expense, hard copies of Catesbeiana only be mailed to museums and libraries. Electronic copies will be sent to all of the other VHS members. Currently only 2-3 individual members are receiving a hard copy. Some attendees felt that a hard copy option with a postage fee might attract additional membership in VHS. The motion passed.

c. Follow-up

With the assistance of Matt Becker, VHS Ex-Com member, a new abstract with key search words will be added to Catesbeiana survey reports. In addition the format has been changed to double columns and the tables and charts legend has also been updated. Some instruction in the new abstract format will be available to survey report authors. The new Catesbeiana changes were well received.

John White, VHS Webmaster, reported that Catesbeiana articles dating back to No. 1 2009 have been scanned at low resolution to the VHS website. These will need to be re-scanned and John suggested perhaps some volunteers at Liberty University might help. Paul Sattler agreed to check on this possibility.

Due to the efforts of Erin Chapman, VHS Ex-Com member, back issues of Catesbeiana will now be included in the Biodiversity Heritage Library (BHL), a widely used scientific data base. Erin indicated that progress will be gradual since volunteers will be adding the back issues.

4. Grants update

Kory Steele, VHS Grants Committee Chair, indicated there are no new grant updates. However, Kory indicated that new grant

requests should preferably be received by mid-January of each calendar year.

5. Permits

Susan Watson requested that VHS members continue to update her with events and other details that require permit amendments as well as educational and outreach events that require annual exhibition permits.

6. Newsletter updates

Bonnie Keller, VHS Newsletter Editor, was unable to attend the meeting. However, by email she indicated she would like to get an early start on the Fall Newsletter and is seeking input from VHS members.

7. Regulatory Affairs

Larry Mendoza, VHS Regulatory Affairs Chair, provided some information about potential VDGIF wildlife viewing plans (Restore the Wild). This should provide an opportunity for VHS (Larry) to directly influence VDGIF management on the importance of including and featuring amphibian and reptile viewing opportunities in the Restore the Wild program. (In a subsequent series of emails on May 23, Larry and Susan Watson provided the Ex-Com with more detail on the VDGIF Restore the Wild planning process).

8. Outreach

a. Members

Mike Salotti, VHS Community Outreach Chair, was unable to attend the meeting. However, he did provide a membership count. VHS now has 328 members including 50 lifetime members and 278 current members. This is most likely a VHS membership record. The Community Outreach program of reminding members of their membership renewal date appears to be working well.

b. Membership cards

Some VHS members have complained that it took a long time to receive membership payment receipts and membership cards. There is a VHS membership card pdf that should be used to promptly email membership cards. Some attendees suggested that we should try to automate the membership card process. Matt Close, VHS Treasurer, indicated that electronic PayPal receipts are sent immediately but may sometimes be blocked as spam. Mile Salotti will be requested to investigate ways to expedite membership card submissions.

c. Tabling Events

Larry Mendoza has been coordinating and leading all VHS tabling events. The requests for VHS tabling events has increased dramatically from 12-14 events in 2018 to 17-18 events in 2019 that have already occurred or been scheduled across the Commonwealth. Whenever it is allowed, Larry will exhibit live snakes from his personal collection. The travel requirements have been extraordinary. Kory Steele suggested that VHS should develop a policy to compensate Larry for his gasoline expense or mileage driven. The IRS publishes an annual mileage expense reimbursement rate that includes items like gasoline expense, vehicle maintenance and depreciation. Dave Perry suggested that the policy should be narrowly limited to this specific travel situation. Some attendees mentioned that the policy would have to be written to avoid violating the VHS Constitution stipulation of no paid personnel. Matt Neff and Matt Close agreed to develop an expense re-imbursement policy for Larry.

VHS should consider advertising exhibition events on our Facebook page and in the VHS Newsletter.

d. Follow-up

Larry indicated that the VHS tabletop exhibit needs to be upgraded. Many of the

photographs are very old and should be replaced and a new tabling cloth should be purchased. In addition, he is out of pens to hand out and needs more VDGIF Frog, Snake and Turtle brochures as 100-150 of these have been handed out and none are left. Jason Gibson suggested the quality of pens should be improved and recommended that VHS should be buying the higher quality pens as John White has done in the past. A television was purchased for the exhibit to air herp videos. Larry will email Matt Neff a listing of desired upgrades for the tabletop exhibit.

9. Education

Mike Clifford, VHS Education Committee Chair, was unable to attend the meeting. However, he did send an email to the Ex-Com reminding us of the need to inform him of all education and training events conducted by VHS members since the 2018 VHS Annual (fall) meeting. These events will be included in the 2019 Education Committee report which will be circulated in advance of the 2019 Annual Meeting.

10. Treasurer

Matt Close presented the May 2019 Treasurer report. The total current balance is $15,940.40. However, there is outstanding grant check in the amount of $500 and the net uncommitted balance is $15,040.40. Of that amount $6,000 is locked into a certificate of deposit which expires in September. Recent large expense items include $2,260.28 for tabletop exhibit supplies and equipment and $612.35 for turtle traps. The Virginia Museum of Natural History made a $1,000 donation to VHS. Matt indicated the VHS membership total is 327, which is one less than Mike Salotti's count of 328.

11. County Record Criteria

a. Reason why no cities

Erin Chapman reviewed a portion of the current VHS policy on distribution records: "New distribution records from large cities that formerly constituted counties (Chesapeake et. al) are acceptable. But records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county." Erin also presented her views and recommendations on the current records distribution policy. As Virginia contains 38 of the 41 independent cities within the USA, she recommends that VHS needs a consistent distribution records policy for the unique borders within Virginia. If area is the criterion, why should Arlington County (26 square miles) be included in distribution records while the city of Roanoke (42.85 square miles), which is completely contained within Roanoke County, be excluded? Several other organizations, such as the Virginia Native Plant Society and the Virginia Omithological Society recognize records from all independent cities. Erin suggested there are two reasons to include records from all independent cities i.e. consistency and data contributions to the emerging field of urban ecology. Erin suggested an area criterion as a second alternative to improve consistency. After a lengthy discussion about some of the pros (consistency) and cons (many records would need to be rewritten) of including distribution records from small independent cities, John White suggested VHS contact Steve Robles, a former VHS Journal Editor, who had been opposed to the inclusion of small independent cities in the VHS distribution records, to understand his reasoning. Kory Steele agreed to contact Steve Robles and report back to the VHS Ex-Com.

b. iNaturalist

Erin Chapmen recommended that VHS take advantage of a potential vast record of Virginia herpetofauna that should be available via citizen science apps such as iNaturalist and Herp Mapper and create an

expedited review process to verify potential herp species distribution records from these sources. VHS verification, especially for iNaturalist, is necessary as some of the "research quality" records are sometimes incorrect. Some of the attendees suggested that there could be copyright issues and indicated that original observers would have to be contacted to gain permission to use their posting and yield copyright protection. Matt Close reported that an iNaturalist posting was used to document a Northern Red-bellied Snake for Craig County. Several attendees noted that the potential for new distribution records is significant. Erin Chapman agreed to conduct a pilot project to make contact with 5 original observers of new herp distribution record observations via iNaturalist and HerpMapper to define the degree of difficulty for verification and obtaining permission to use. Erin will report her results to the Ex-Com.

12. Logo

a. Logo Contest

Matt Neff announced that the winner of the VHS logo contest is Ayla Elliott, who will receive the $150 logo contest award. Matt will announce the winner shortly after the Spring Survey weekend.

b. Voting on amending constitution to new logo

Sixteen VHS members were in attendance at the time of the vote. Thirteen votes were affirmative and three abstained from voting. As a result of the greater than 2/3 affirmative vote, the VHS constitution will be amended for the new logo.

13. Complimentary Books

As a result of VHS financial contributions to the project through their indiegogo fundraising campaign, Matt Close was provided a gift of ten complimentary copies of "A Primer on Reptiles and Amphibians: A Collection of Educational Bulletins" A Conservation through Education Project by Micha Petty. Matt suggested these could either be sold or perhaps awarded to VHS student contributors.

With no additional topics to discuss, the meeting was adjourned by Matt Neff at approximately 19:55 hr.

David A. Perry
VHS Secretary

Virginia Herpetological Society
Treasurer's Report
June 14, 2019

Previous Balance (corrected)	$	14,147.54
Net Receipts (excludes PayPal Fees)		
Membership Dues	$	4721.57
Donations	$	1410.00
Silent Auction-Fall Meeting	$	172.00
Amazon Smile	$	128.04
CafePress Inc.	$	31.57
Unused 2018 Grant Funds	$	300.00
Expenses		
2019 VHS Grants Awarded	$	950.00
Fall Meeting Expenses (Snacks, Drinks, Lunches)	$	682.37
Photo Contest	$	50.00
Tabling Supplies and Equipment (Live Animal Displays)	$	2280.28
Survey Supplies (Turtle Traps)	$	612.35
Collecting Permit	$	20.00
Website Hosting	$	28.16
2019 SCC E-File	$	25.00
Postage	$	28.92
Miscellaneous Fees	$	195.24
Current Gross Balance	$	16,038.97
Savings C.D. (renewable 09/30/2019)	$	6,000.00
Current Available Balance (unencumbered)	$	10,038.97

VHS Memberships (dues current)	
Regular:	245
Student:	22
Lifetime:	62
Total	**329**

Matthew Close
VHS Treasurer

Field Notes

The field notes section of *Catesbeiana* provides a means for publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior, and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. **All field notes must include a brief statement explaining the significance of the record** (e.g., new county record) **or observation** (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed pending consultation with the author(s).

If the field note contains information on a **new county (or state) record**, **verification is required in the form of a voucher specimen** deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a **photograph** (print, slide, or digital image) **or recording** (cassette tape or digital recording of anuran calls) deposited in the archives of the Virginia Herpetological Society. Photographs and recordings should be sent to the editor for verification and archiving purposes; the identity of voucher specimens must be confirmed by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult Mitchell and Reay (1999. *Atlas of Amphibians and Reptiles in Virginia*), Mitchell (1994. *The Reptiles of Virginia*), and Tobey (1985. *Virginia's Amphibians and Reptiles: A Distributional Survey*) [**both atlases are available on-line on the VHS website**] as well as other recent literature to determine if they may have a new county record. New distribution records from large cities that formerly constituted counties (Chesapeake, Hampton, Newport News, Suffolk, and Virginia Beach) are acceptable, but records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

PHOTOGRAPHS

High contrast photographs (prints, slides, or digital images) of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Digital images are preferred. Prints should be on glossy paper and no larger than 5 x 7 inches. Published photographs will be deposited in the Virginia Herpetological Society archives.

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